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Biography William Wu (Principal Investigator) joined the Communication Architectures and Research Section at the Jet Propulsion Laboratory in October of 2010, and is a member of the Information Processing Group (332B). Motivated by computational limitations of the Nyquist-Shannon paradigm in spectroscopy, imaging, and ultrawideband systems, his Ph.D. research at Stanford focused on deriving extensions to Shannon's 1949 sampling theorem in the discrete, finite-dimensional setting. His graduate work also included practical implementations of convex optimization algorithms in real-world wireless LANs.

At JPL, he is the Telecommunications Cognizant Engineer for Optical Payload for Lasercomm Science (OPALS), a flight project that will be the first-ever JPL demonstration of free-space optical communications. He is also the Simulation and Analysis Lead responsible for the dynamic mitigation of electromagnetic interference on the Mars Reconnaissance Orbiter (MRO), using spectral estimation and novel filter designs. His research interests include signal processing, communications, information theory, and recreational math. William is also the creator of wuriddles.com, a popular archive of mathematical puzzles with an active forum community of over 10,000 registered users.

Education

- Ph. D., Electrical Engineering, Stanford University, 2010
- M.S., Mathematics, Stanford University, 2009
- M.S., Electrical Engineering, Stanford University, 2005
- B.S., Electrical Engineering and Computer Sci., University of California, Berkeley, 2003.

- Visitorships: Tsinghua University, 2007

Research Interests

- Signal processing, telecommunications, information theory, error-correcting codes
- Efficient algorithms and statistical analysis for massive data sets
- Applications of computer science and mathematics to environmental earth sciences
- Cryptography, electronic security, and web-based data management
- Combinatorics and recreational mathematics

Projects

- OPALS: Optical Payload for Lasercomm Science
- MRO: Mars Reconaissance Orbiter

Professional Experience

- Jet Propulsion Laboratory (2010 - present)
- OPALS: Telecommunications Cognizant Engineer
- MRO: Simulation and Analysis Lead for electromagnetic interference mitigation

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Selected Publications

1. W. Wu, J. T. Gill, "Twenty Questions Games Always End With Yes," submitted to *IPN Progress Report*, Jet Propulsion Laboratory.

2. S. Li, W. Wu, "FIND-SS: a fast algorithm for sparse matrix computations related to inversion," submitted to *Journal of Computational Physics.*

3. S. Li, W. Wu, "FIND-SS: a New Sparse Matrix Inverse Related Algorithm," *International Congress on Industrial and Applied Mathematics*, July 2011.

4. H. Ditsmarch, J. Eijck, W. Wu, "Verifying 100 Prisoners and a Light Bulb," *Journal of Applied Non-Classical Logics*, 2010.

5. W. Wu, "Discrete Sampling: Discrete Generalizations of the Nyquist-Shannon Sampling Theorem," *Stanford University Ph.D. Thesis*, June 2010.

6. J. C. Koo, W. Wu, J. T. Gill, "Delay-Rate Tradeoff for Ergodic Interference Alignment In the Gaussian Case," *48th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, Sept. 29 -- Oct. 1, 2010, pp. 1069-1075.

7. Y. Liu, W. Wu, W. Bo, "Measurement-Based Channel Management in WLANs," *IEEE Wireless Communications and Networking Conference*, 2010.

8. H. Ditsmarch, J. Eijck, W. Wu, "100 Prisoners and a Light Bulb -- Logic and Computation," *12th Intl. Conference on Principles of Knowledge, Representation, and Reasoning*, 2010.

9. W. Wu, B. Osgood, "Falling Factorials, Generating Functions, and Conjoint Ranking Tables," *Journal of Integer Sequences*, Vol. 12, 2009, Article 09.7.8.

10. W. Bo, W. Wu, Y. Liu, "Dynamic Channel Assignment in Wireless LANs," *Power Electronics and Intelligent Transportation Systems*, 2008.